

Introduction to Botany. Lecture 15

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Outline

- 1 Questions and answers
- 2 Morphology of leaf
- 3 Leaves in nature

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Previous final question: the answer

How many levels of hierarchy has this leaf?



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3

Terminal characters

Terminal (leaflet) characters are applicable only to terminal parts (normally, leaflets) of leaves:

- Form of base
- Form of tip
- Type of margin
- Surface
- Venation

Terminal characters: base of leaf blade

- Rounded
- Truncate (straight)
- Cuneate
- Cordate
- Sagittate

Terminal characters: leaf apex

- Rounded
- Mucronate
- Acute
- Obtuse
- Acuminate
- Retuse

Terminal characters: leaf margin

- Without teeth: smooth
- With teeth
 - Dentate
 - Serrate
 - Crenate
- Could be double-dentate, triple-serrate etc.

Terminal characters: leaf venation

Main vein Lateral veins	No	One	Several
	No	Apodromous	Hypho- Acro-
Several	Acrodromous	Ptero-	Actino-

Heterophylly

- Juvenile and adult leaves
- Water and air leaves
- Sun leaves and shade leaves

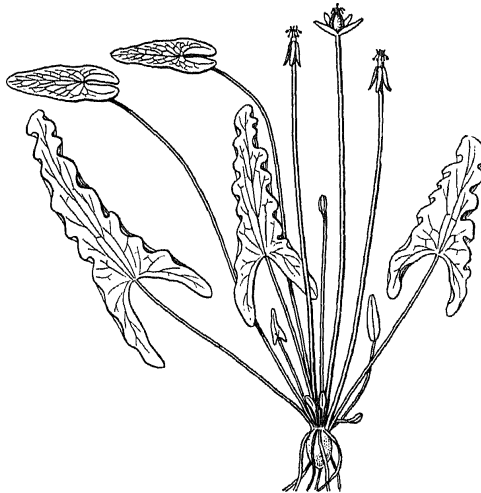
Juvenile leaves of *Juniperus* sp.



Juvenile leaves of *Eucalyptus* sp.



Submerged and floated leaves of *Ondinea*



Leaf mosaic

- Distribution of leaves of plants in a single plane, usually perpendicular to light rays
- Provides the least shading of leaves by one another

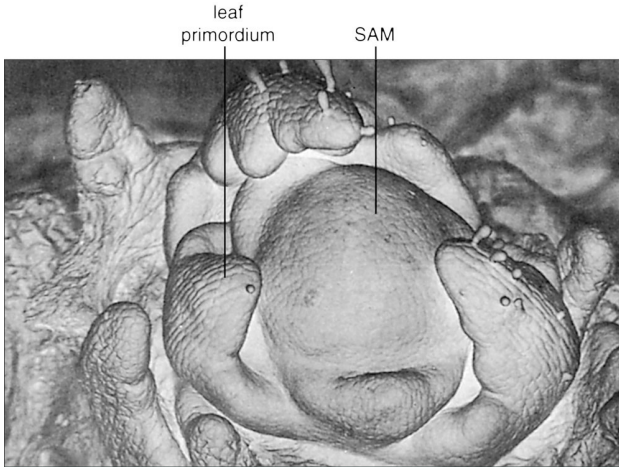
Leaf mosaic of red maple (*Acer rubrum*)



Seasonal life of leaves

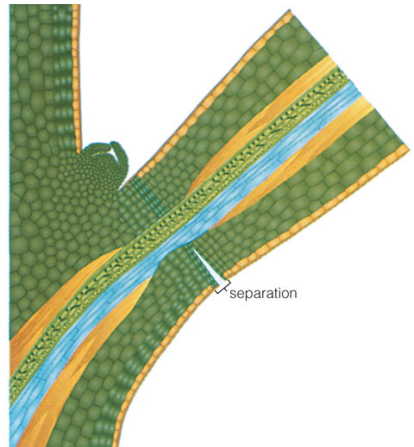
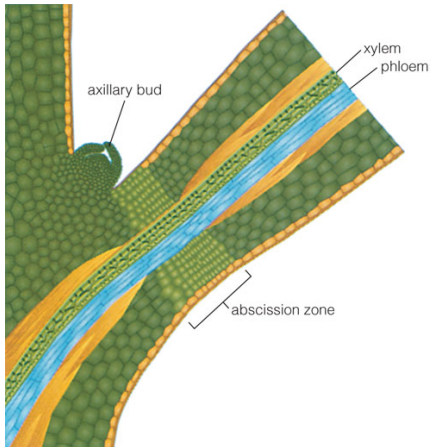
- Leaves arise from SAM through leaf primordia
- Old leaves separate from plant in a region called abscission zone

Leaf primordia



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Abscission zone



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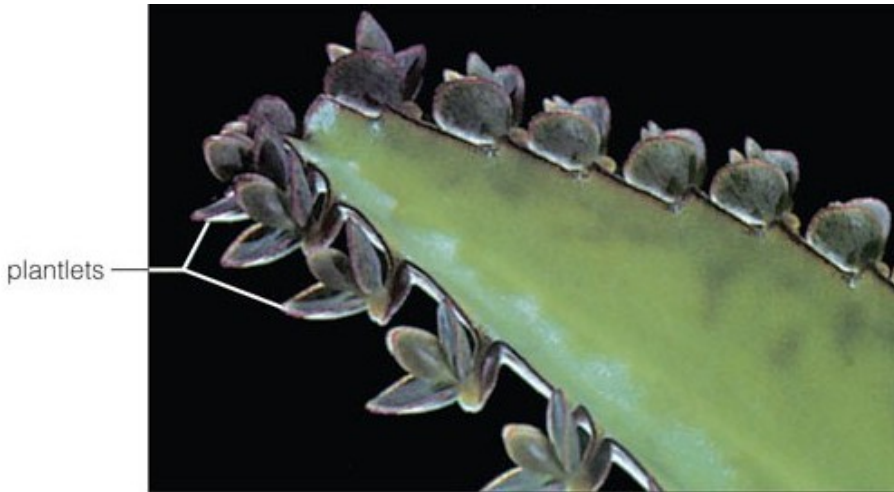
Leaf modifications

- Spines
- Tendrils
- Bulbs
- Plantlets

Tendrils of sweet pea (*Lathyrus odoratus*)



Plantlets on the leaf of *Kalanchoe pinnata*



Leaf of Venus flytrap (*Dionaea muscipula*)

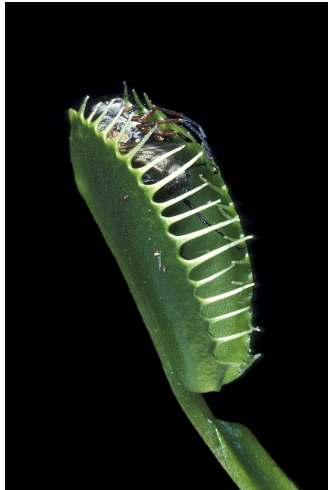


Table of modifications

<i>Function</i>	Stem / shoot	Leaf	FU	Root
Expansion	Rhizomes, stolons	Plantlets	...	Ratoons
Storage	Bulbs, corms, tubers	Succulent leaves	...	Storage roots
Photosynthesis	Cladophylls	DEFAULT	...	Green roots aerial roots
Defense	Thorns	Spines, scales	...	Root spines
Support	DEFAULT	Leaf tendrils	...	Aerial and contractile roots
Interactions	Hollows	Traps, “sticky tapes”, urns	...	Mycorrhizae, nodules

Summary

- Leaves have **general**, **repetitive** and **terminal** characters
- **Heterophylly** is a co-existence of different types of leaves on the same plant
- **Abscission zone** helps the separation of leaf at the end of season

Final question (3 points)

Final question (3 points)

Please draw the **entire** (not dissected), **ovate** leaf with **acute** apex, **cordate** base, **smooth** margin and **hypodromous** venation.

For Further Reading



J. E. Bidlack, Sh. H. Jansky.
Stern's introductory plant biology. 12th edition.
McGraw-Hill, 2011.
Chapter 7.



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.
Plant Biology. 2nd edition.
Thomson Brooks/Cole, 2006.
Chapter 6.